



Fact Sheet

Web Services

Introduction

The U.S. Environmental Protection Agency's (EPA) nationwide, voluntary program, AIRNow (www.airnow.gov), provides real-time air quality data and forecasts to protect public health across the United States, Canada, and parts of Mexico. AIRNow receives real-time ozone and PM_{2.5} data from over 2,000 monitors and collects air quality forecasts for more than 300 cities.

As part of the Global Earth Observation System of Systems (GEOSS) (www.epa.gov/geoss) program, the AIRNow Gateway system broadens access to AIRNow data and data products. AIRNow Gateway produces data products in several standard data formats and makes them available via FTP and web services. This document describes the web services.

All data provided by AIRNow Gateway are made possible by the efforts of more than 120 local, state, tribal, provincial, and federal government agencies (www.airnow.gov/index.cfm?action=airnow.partnerslist). These data are not fully verified or validated and should be considered preliminary and subject to change. Data and information reported to AIRNow from federal, state, local and tribal agencies are for the express purpose of reporting and forecasting the Air Quality Index (AQI). As such, they should not be used to formulate or support regulation, trends, guidance, or any other government or public decision making. Official regulatory air quality data must be obtained from EPA's Air Quality System (AQS) (www.epa.gov/ttn/airs/airsaqs).

About the Air Quality Index

The EPA developed the Air Quality Index (AQI) which reports levels of ozone, particle pollution, and other common air pollutants on the same scale. An AQI reading of 101 corresponds to a level that is above the national air quality standard—the higher the AQI rating, the greater the health impact.

The AQI is divided into color-coded categories, and each category is identified by a simple informative descriptor. The descriptors are intended to convey to the public information about how air quality within each category relates to public health. The table below defines the AQI categories.

AQI Numbers	AQI Category (Descriptor)	AQI Color	Color Formulas	
			(RGB)	(CMYK)
0 - 50	Good	Green	0,228,0	224,0,224,30
51 - 100	Moderate	Yellow	255,255,0	0,0,255,0
101 - 150	Unhealthy for Sensitive Groups	Orange	255,126,0	0,132,255,0
151 - 200	Unhealthy	Red	255,0,0	0,255,255,0
201 - 300	Very Unhealthy	Purple	153,0,76	0,153,80,102
301 - 500	Hazardous	Maroon	76,0,38	0,76,38,179

About Web Services

Web services are a means for computers or applications to exchange information regardless of programming language or operating platform. Web services use Extensible Markup Language (XML) to tag data in such a way that they can be read by a variety of applications. Web services are made up of one or more operations that users can call from an application. These operations are like functions that reside on another computer. Neither a copy of the function nor the data have to reside on a user's local computer to make use of a web service. By using the Internet as a conduit, anyone can access a web service without having to go through firewalls or worry about platform compatibility. Web services are not designed to be used as standalone applications. They are called from a web site or other program. The web services then return the data in XML format to the web site or program that called the web service. Every web service has a Web Services Description Language (WSDL) file that tells programmers what inputs are needed to call the operations within the web service.

For help with web services, the following links may be useful

http://en.wikipedia.org/wiki/Web_services

http://www.xml.org/xml/resources_whitepapers.shtml

<http://www.dummies.com/WileyCDA/DummiesArticle/id-1932,subcat-PROGRAMMING.html>

<http://www.devx.com/Microsoft/Article/6595>

AIRNow Gateway Web Service

The operations (or functions) available through the AIRNow Gateway web service are listed below. Specifications for each operation are detailed in the tables that follow.

AIRNow Gateway WSDL file: <http://webservices.airnowgateway.org/Services/AIRNowSoapHttpPort?WSDL>

- Operations:
- 1) GetSiteInfoByAQSCCodeXML and
GetSiteInfoByAQSCCodeXMLRowSet
 - 2) GetOzone24HrAQIXML and
GetOzone24HrAQIXMLRowSet
 - 3) GetPM25Mid24HrAQIXML and
GetPM25Mid24HrAQIXMLRowSet
 - 4) GetReportingAreaMaxAverageAQIXML and
GetReportingAreaMaxAverageAQIXMLRowSet
 - 5) GetSiteMaxAverageAQIXML and
GetSiteMaxAverageAQIXMLRowSet
 - 6) GetForecastsByIssueDateXML and
GetForecastsByIssueDateXMLRowSet
 - 7) GetActionDaysByDateXML and
GetActionDaysByDateXMLRow Set
 - 8) GetReportingAreasXML and
GetReportingAreasXMLRowSet
 - 9) GetStatus

1) GetSiteInfoByAQSCodeXML and GetSiteInfoByAQSCodeXMLRowSet

Description	Get all metadata associated with a site		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
AQSCode	9-digit AQS Code. “*” will return all values.	Text	060670010
Output Field Specifications			
Field	Description	Format	Example
AQSCode	9-digit AQS Code	Text	060670010
SiteName	AIRNow site name	Text	Sacramento – T Street
AgencyName	Name of agency delivering data from the site	Text	California Air Resources Board
State	Abbreviated name of state in which site is located	Text	CA
County	Name of county in which site is located	Text	Sacramento
MSA	Name of Metropolitan Statistical Area in which site is located	Text	Sacramento, CA
SiteAddress	Street address of the site	Text	n/a
GMTOffset	Number of hours to add to the time to convert to the local time zone. For example, EST=-5, PST=-8	Hours	-8
SiteType	Type of site in AIRNow (Real or Proxy)	Text	Real
GeoType	Type of geographic location of the site (Urban, Rural)	Text	Urban
Elevation	Elevation of site location	Meters	0
Latitude	Latitude of site location	Degrees	38.5583
Longitude	Longitude of site location	Degrees	-121.4919
Parameter	Parameter measured at site	Text	PM2.5
PublicReporting	Status of site for public reporting (1=yes, 2=no)	Numeric	1

2) GetOzone24HrAQIXML and GetOzone24HrAQIXMLRowSet

Description	Get 24 hours of 8-hr average ozone concentration and AQI values.		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
AQSCode	9-digit AQS Code. “*” will return all values.	Text	060670010
GMTDateTime	GMT date and time of the first hour of data requested in the following format: ‘YYYY-MM-DDThh:mm:ss-00:00’ where 00:00 is the GMT offset	Text	2007-07-06T08:00:00-07:00
Output Field Specifications			
Field	Description	Format	Example
AQSCode	9-digit AQS Code	Text	060670010
DataSource	Name of agency providing data	Text	California Air Resources Board
TimeLSTBeginHour	Local standard time in begin hour	Hour	17
Ozone8HrPPB	8-hr average ozone concentration in ppb	Numeric	53
Ozone8HrAQI	8-hr average ozone AQI	Numeric	41
DateTimeGMT	GMT date and time in begin hour	Date	06-JUL-2007 17
DateTimeLST	LST date and time in begin hour	Date	06-JUL-2007 09

3) GetPM25Mid24HrAQIXML and GetPM25Mid24HrAQIXMLRowSet

Description	Get 24 hours of mid-point 24-hr average PM _{2.5} concentration and AQI values. These are the PM _{2.5} surrogates used for the real-time maps.		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
AQSCode	9-digit AQS Code. “*” will return all values.	Text	060670010
GMTDateTime	GMT date and time of the first hour of data requested in the following format: ‘YYYY-MM-DDThh:mm:ss-00:00’ where 00:00 is the GMT offset	Text	2007-07-06T08:00:00-07:00
Output Field Specifications			
Field	Description	Format	Example
AQSCode	9-digit AQS Code	Text	060670010
DataSource	Name of agency providing data	Text	California Air Resources Board
TimeLSTBeginHour	Local standard time in begin hour	Hour	8
PM25Mid24HrUgM3	Mid-point 24-hr average PM _{2.5} concentration in ug/m3	Numeric	16.625
PM25Mid24HrAQI	Mid-point 24-hr average PM _{2.5} AQI	Numeric	53
DateTimeGMT	GMT date and time in begin hour	Date	06-JUL-2007 17
DateTimeLST	LST date and time in begin hour	Date	06-JUL-2007 09

4) GetReportingAreaMaxAverageAQIXML and GetReportingAreaMaxAverageAQIMXLRowSet

Description	Get reporting area maximum AQI values by pollutant and date.		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
ReportingArea	AIRNow reporting area name. "*" will return all reporting areas.	Text	Sacramento
State	Abbreviated name of state in which reporting area is located. "*" will return all states.	Text	CA
DateTime	Date for which AQI data is requested in the following format: 'YYYY-MM-DDThh:mm:ss-00:00' where 00:00 is the GMT offset	Text	2007-07-05T08:00:00-07:00
Output Field Specifications			
Field	Description	Format	Example
ReportingArea	AIRNow forecast reporting area name	Text	Sacramento
State	Abbreviated name of state in which reporting area is located	Text	CA
DataSource	Name of agency providing data	Text	Sacramento Metro. AQMD
Parameter	Parameter name	Text	Ozone-8Hr
AQI	AQI value	Numeric	192
Category	AQI category, where 1=Good, 2=Moderate, 3=USG, 4=Unhealthy, 5=Very Unhealthy, 6=Hazardous	Numeric	4

5) GetSiteMaxAverageAQIXML and GetSiteMaxAverageAQIXMLRowSet

Description	Get site maximum AQI values by pollutant and date.		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
AQSCode	9-digit AQS Code. “*” will return all values.	Text	060670010
DateTime	Date for which AQI data is requested in the following format: ‘YYYY-MM-DDThh:mm:ss-00:00’ where 00:00 is the GMT offset	Text	2007-07-05T08:00:00-07:00
Output Field Specifications			
Field	Description	Format	Example
AQSCode	9-digit AQS Code	Text	060670010
DataSource	Name of agency providing data	Text	California Air Resources Board
Parameter	Parameter name	Text	Ozone-8Hr
AQI	AQI value	Numeric	111
Category	AQI category, where 1=Good, 2=Moderate,3=USG, 4=Unhealthy, 5=Very Unhealthy, 6=Hazardous	Numeric	3

6) GetForecastsByIssueDateXML and GetForecastsByIssueDateXMLRowSet

Description	Get forecasted AQI values and categories for a reporting area by pollutant and date.		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
ReportingArea	AIRNow reporting area name. "*" will return all values.	Text	Sacramento
State	Abbreviated name of state in which reporting area is located. "*" will return all values.	Text	CA
DateTime	Date for which AQI data is requested in the following format: 'YYYY-MM-DDThh:mm:ss-00:00' where 00:00 is the GMT offset	Text	2007-07-04T00:00:00-07:00
Output Field Specifications			
Field	Description	Format	Example
ReportingArea	AIRNow reporting area name	Text	Sacramento
State	Abbreviated name of state in which reporting area is located	Text	CA
DataSource	Name of agency providing data	Text	Sacramento Metro. AQMD
DateIssue	Date forecast was issued	Date	7/4/2007
DateForecast	Date forecast is valid	Date	7/5/2007
Ozone8HrAQICategory	Forecasted 8-hr ozone AQI category, where 1=Good, 2=Moderate, 3=USG, 4=Unhealthy, 5=Very Unhealthy, 6=Hazardous	Numeric	3
Ozone8HrAQI	Forecasted 8-hr ozone AQI value	Numeric	140
Ozone8HrActionDay	Forecasted 8-hr ozone action day, where 1=Yes, 0=No	Numeric	1
PM24HrAQICategory	AQI category, where 1=Good, 2=Moderate, 3=USG, 4=Unhealthy, 5=Very Unhealthy, 6=Hazardous	Numeric	1
PM24HrAQI	AQI value	Numeric	40
PMActionDay	Forecasted 24-hr PM2.5 action day, where 1=Yes, 0=No	Numeric	0

7) GetActionDaysByDateXML and GetActionDaysByDateXMLRowSet

Description	Get list of action days for a reporting area within a date range.		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
ReportingArea	AIRNow reporting area name. “*” will return all values.	Text	Sacramento
State	Abbreviated name of state in which reporting area is located. “*” will return all values.	Text	CA
Startdate	First date in range to check for action days in the following format: ‘YYYY-MM-DDThh:mm:ss-00:00’ where 00:00 is the GMT offset	Text	2006-05-01T00:00:00-07:00
Enddate	Last date in range to check for action days in the following format: ‘YYYY-MM-DDThh:mm:ss-00:00’ where 00:00 is the GMT offset	Text	2006-09-30T00:00:00-07:00
Output Field Specifications			
Field	Description	Format	Example
ReportingArea	AIRNow reporting area name	Text	Sacramento
State	Abbreviated name of state in which reporting area is located	Text	CA
DataSource	Name of agency providing data	Text	Sacramento Metro. AQMD
Date	Date of an action day	Date	7/4/2007

8) GetReportingAreasXML and GetReportingAreasXMLRowSet

Description	Get the complete list of AIRNow reporting areas.		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
Output Field Specifications			
Field	Description	Format	Example
ReportingArea	AIRNow reporting area name	Text	Sacramento
State	Abbreviated name of state in which reporting area is located	Text	CA

9) GetStatus

Description	Checks inputs for accuracy		
Input Field Specifications			
Input	Description	Format	Example
Login	AIRNowTech username	Text	test@testing.com
Password	AIRNowTech password	Text	testpassword
Output Field Specifications			
Field	Description	Format	Example
Status	Describes any errors in input fields. If there are no errors, “No Errors” is returned.	Text	Wrong login and/or password

U.S. Environmental Protection Agency (EPA)

AIRNow Data Exchange Guidelines

The EPA AIRNow Data Exchange Guidelines apply to data available from the AIRNow program, which includes these data portals: AIRNow.gov, AIRNow-Tech, and AIRNow Gateway. The purpose of the guidelines is to make all interested parties aware of the nature and objective of real-time air quality information.

- AIRNow observational data are not fully verified or validated; these data are subject to change and should be considered preliminary. Data and information reported to AIRNow from federal, state, local, and tribal agencies are provided for the express purpose of reporting and forecasting the Air Quality Index (AQI). As such, they should not be used to formulate or support regulation, ascertain trends, act as guidance, or support any other government or public decision-making. Official regulatory air quality data must be obtained from EPA's Air Quality System (AQS).
- Only validated data should be used for reports and data analysis whenever possible. AIRNow data are raw data and should never be substituted for validated data stored in the AQS archive.
- Credit should first be given to the appropriate source—federal, state, local, and tribal air quality agencies and the EPA AIRNow program—in products, publications, presentations, or any other related distribution. These federal, state, local, and tribal air quality agencies are the owners of the data and the authorities for the data. A list of state/local/tribal agencies can be found at <http://www.airnow.gov/index.cfm?action=airnow.partnerslist>.
- Air quality data, forecast values, and advisory statements should not be altered in any way and should be disseminated as received.
- Federal, state, local, and tribal air quality agencies are the authority for issuing air quality forecasts and advisories. Forecasts, advisories, advisory names, and notifications should not be altered in any way.
- Air quality observed and forecast values should be disseminated in accordance with the AQI and corresponding RGB colors as directed in the Guideline for Reporting of Daily Air Quality-Air Quality Index (AQI) <http://www.epa.gov/ttn/oarpg/t1/memoranda/rg701.pdf>.
- All end-users who receive these data should be provided with the most current data available, in particular, advisories issued by federal, state, local, and tribal air quality agencies. The AIRNow program updates all data feeds several times per hour.
- If observational data are used for analyses, displayed on web pages, or used for other programs or products, the analysis results, displays, or products must indicate that these data are preliminary.
- That publications, analyses, products, and/or derived information rely on these data must be made known to the relevant federal, state, local, and tribal air quality agencies and the EPA AIRNow program.
- Data users' contact information must be kept current for the purposes of informing users of these data about any program or product updates and/or problems.
- Questions about AIRNow data, forecasts, and advisories should be directed to AIRNowDMC@sonomatech.com and white.johne@epa.gov.

Please return this completed form via e-mail to AIRNowDMC@sonomatech.com or fax it to 707-665-9800.

We agree to abide by the principles of the EPA AIRNow Data Exchange Guidelines:

Name:	Title:
E-mail:	Phone:
Organization:	Date:

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